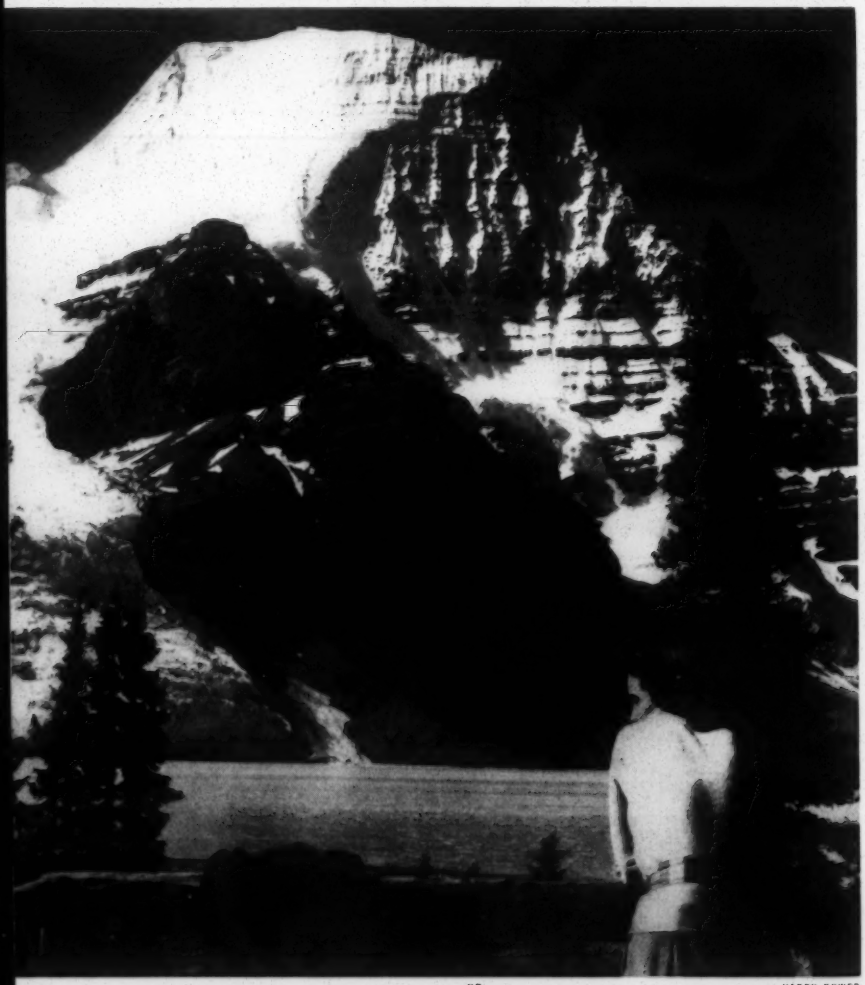
# GEOGRAPHIC SCHOOL BULLETINS

THE NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON 6, D.C.

VOLUME 37, NUMBER 8, NOVEMBER 24, 1958 . . . *To Know This World, Its Life*

85

HARRY ROWED

MOUNT ROBSON, highest in Canadian Rockies, juts over booming British Columbia

*NEXT WEEK the Bulletins take you to Poland for a searching look at life behind the Iron Curtain.*

- New York's Wild Forest Preserve
- African Libya Builds a New Capital
- WATER HYACINTH—Handsome Pest
- Infrared, Your Invisible Servant
- Rich Rugged British Columbia

UMI

the amendment have been made almost every year since. Lumbermen, railroads, and dam-builders regularly sought to modify the provision. Some relaxations have been made—to allow widening and straightening roads, to permit the building of a few ski lifts on mountain slopes, and for similar uses.

The only other improvements have been trail cutting and campsite building to allow the owners—the citizens of New York—easier access to their wild property.

The Forest Preserve was a landmark in American forestry. Although it was not the first state forest set aside, it antedated the creation of the National Forests by six years. From it grew the first forestry school in the United States, at Cornell University.

The Preserve is not the same as the New York State Parks. Much of it lies within two State parks—Adirondack and Catskill—but these parks include also much private land. The Preserve is made up of parcels ranging from a few acres to thousands, scattered through the parks. Some parcels are outside park boundaries.

While private lands inside the parks can be cut over, the Preserve remains inviolate. There deer, beaver, bear, and ruffed grouse (right) find a home. Trees grow and fall to feed other trees, just as they did before Henry Hudson sailed into his river.

GEORGE SHIRAS, 3RD.

New Yorkers reap another benefit from their "forever wild" land, even if they never go near it. The forest floor, with its accumulation of dead leaves and wood, acts as a gigantic sponge. It absorbs rainfall. The water filters through, tending to keep streams and rivers at a more constant flow, holding back floods and cutting dry spells.

The mighty Hudson River, a foundation of New York State's position as a trader with the world, first rises in the Forest Preserve, and is fed by its woodland streams.

F. S.

LELAND J. PRATER FROM U. S. FOREST SERVICE

**HOLDING THE SOIL—** A vivid demonstration of the value of forested slopes in keeping soil where it belongs. These stone walls lie at the bottom of a reservoir in the watershed supplying New York City. For 65 years they were covered with water. Finally exposed by a drought, they show almost no sediment washed in by erosion. The reservoir's capacity is used for water, not silt.



UMI

# Wilderness In New York

A CANOEIST PAUSES at evening to drink the flute-like music of the shy hermit thrush. A wilderness stream gurgles harmony. The scene is not a park in the West, nor an undeveloped area of British Columbia, but New York—the most populated State in the Union.

He stands in the Forest Preserve, an area bigger than any National Park, an area that far-sighted New Yorkers set aside almost a century ago to be forever wild.

Preservation of these woodlands gives New Yorkers a 2,500,000-acre estate where they can hike or canoe, swim or ski, hunt or fish. The less active can simply drive through and enjoy the scenery. More important, in a time when people live ever closer together, the Forest Preserve offers solitude.

HOWELL WALKER, NATIONAL GEOGRAPHIC STAFF

It also gives a picture of what the State looked like to its first settlers, when it seemed the woods were unending. In those days the green mantle was ripped from the earth with ax and saw. Oddly enough, from this destruction the Preserve was born.

By 1885, worried citizens realized that if the cutting continued without control, there would be no woods left. Against strong opposition, they succeeded in pushing through the State Legislature a law designating State-owned land in the Adirondack and Catskill Mountains as a preserve. It was to be protected against cutting and fire. More trees were to be planted, and the public educated in conservation.

Rejoicing friends of the woods forgot that what legislatures do they can also undo. Commercial interests had the law weakened and the crash of pine and spruce was heard again in the Preserve.

Determined to halt the exploitation, the pro-woods partisans took their case to the people in a constitutional referendum. Written into the organic law of the State, where it could not be changed except by agreement of two consecutive legislatures and another popular vote, was the declaration:

*The lands . . . constituting the forest preserve . . . shall be forever kept as wild forest lands. They shall not be leased, sold, or exchanged, or be taken by any corporation, public or private, nor shall the timber thereon be sold, removed, or destroyed.*

That was in 1894. Efforts to weaken

**GEOGRAPHIC SCHOOL BULLETINS,** copyright © 1958 by the National Geographic Society, Melville Bell Grosvenor, President. Published weekly during school months by the School Service Division, Ralph Gray, Chief. Assts.: Arthur P. Miller, Jr., Frank Sartwell, Katherine Crapster, Edward Schulz. Entered as second class matter, Wash., D.C. International copyright. All rights reserved. Rates: United States, $2.00 for 30 issues (one school year); Canada, $2.25; elsewhere, $2.50. U. S. only, three years (90 issues) for $5.00. The National Geographic Society is a nonprofit educational and scientific society established for the increase and diffusion of geographic knowledge.

EMIL BRUNNER

ONE OF THE POOREST countries in the world, Libya can farm only its coastal fringe and scattered oases in the desert to the south. The vegetable dealer in Tripoli's large *souk*, or market, (above) weighs carefully. Adjoining the United States' Wheelus Air Force Base with its modern planes and electronic equipment, hand labor harvests salt from sun-dried Mediterranean water (below).

Nations orphan. In 1951, it was taken into the growing postwar family of independent nations. Its provinces, Tripolitania on the west, Cyrenaica on the east, and the landlocked desert of Fezzan, were federated.

Thus began Libya's curious tale of two cities. Tripoli was the cosmopolitan queen city of the former Italian colony, Tripolitania. Benghazi was the capital of the bleak province from which Idris sprang.

War turned Benghazi into a ghost city, with wounds raw and glaring. Even now, though the population has risen to 70,000, nearly everyone lives in an incomplete house. Stairways in bombed-out buildings may end abruptly in space.

Tripoli, on the other hand, suffered little. The new nation inherited it as a modern, finely proportioned commercial city, with office buildings, apartments, hospitals, hotels, villas, cafés, movie theaters, boulevards, and public squares. To its 130,000 residents, European sports cars and American convertibles are more familiar than camels.

Ostensibly Beida will replace dusty, sun-baked Benghazi as the state capital of Cyrenaica. But no one overlooks the possibility that it may become Libya's only national capital—a pleasant spot where the roving government may at last come to rest.

HOMER F. KELLEMS

UMI

ALFRED W. COOK

# LIBYA BUILDS A THIRD CAPITAL

HORSEMEN PARADING through the streets of Tripoli celebrate the independence of one of the world's newest nations.

Libya, a "box of sand" in the north of Africa, became her own master on Christmas Eve, 1951. Like ancient Gaul, she is divided into three parts. She already has two capital cities and is building a third.

Aside from a fertile strip along the Mediterranean, Libya might be called "worthless desert" by someone who did not remember that Saudi Arabia merited the same description before its vast wealth in oil was discovered. Western oil interests are pouring millions into the search in the Libyan Sahara.

Whatever the results of the oil hunt, Libya has another source of importance—her geographical position. On the east she adjoins Egypt, with its ambitions as leader of a new Arab empire. To the west lie Tunisia, even newer to independence, and nationalist-troubled Algeria.

The United States maintains in Libya one of its biggest overseas posts, the Wheelus Air Force Base, an important way station for military transport craft.

Libya has a history of conquerors so long that an American journalist, ticking them off "a, b, c," through the ages, stopped finally at the letter "s."

This generation's history is written in Mussolini's ill-starred dreams of empire, and in the dispatches of Rommel's Afrika Korps and the British Eighth Army. For two years grim desert warfare seesawed along Libya's coast.

Today's two capitals became famous in those shattered days: Tripoli and Benghazi, both desert ports. Under the Libyan constitution they have equal status. The government shuttles between.

Now a new capital city is rising at King Idris's summer retreat, the village of Beida in Libya's coastal highlands, 100 miles east of Benghazi. Unlike the two low-lying capitals, Beida has mountain breezes, clumps of pine and cedar, and abundant water.

Beida was Idris's camping spot in his struggle against the Italian Fascist invaders. Libyans also say it is the death place of a disciple of the Prophet Mohammed. This makes it a religious shrine for the Moslems of Arab Libya.

Libya ended the war as a United

LUIS MARDEN, NATIONAL GEOGRAPHIC STAFF

million a year suffered by Louisiana, are backing a bill to assure Federal help in fighting the plant.

The proposed law would authorize a broad control project, under the Army Corps of Engineers, in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas.

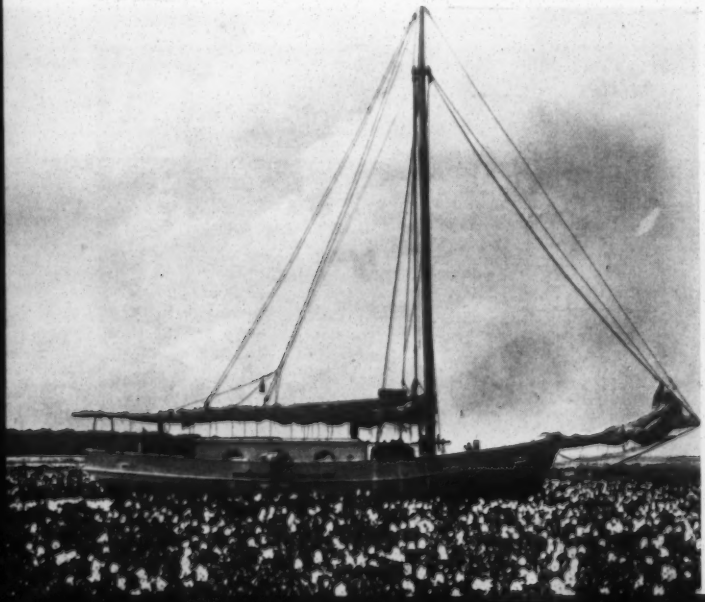
Last year, reports from the Congo declared that the pretty pest has already run up a bill of more than a million dollars. The trouble started, it is believed, when a few plants escaped from a botanical garden or the pretty pool of a colonist.

Authorities at first tried to hack through the rafts by force—a procedure which only increased them. Then flame throwers were tried, but underwater parts lived to bloom again. Steamships were forced to stop several times a day to clear the weeds from propellers or paddle wheels. Rudders wouldn't work. Buoys marking dangerous channels were hidden. Villages along the banks were isolated.

Spraying with the plant poison 2,4-D cuts down the plague, but the hyacinth always seems to bounce back.

Now reports of trouble are coming from the Nile. An infestation in the upper reaches has spawned rafts 50 feet across that interfere with cargo boats and clog the water intakes of their engines. F.S.

R. S. STROUT



**CLINGING MASSES** of water hyacinth catch at sailboats as well as foul the propellers of power vessels. The 37-foot sloop *Igdrasil* here lies in a bed of hyacinths off Jacksonville, Florida, before starting on a cruise around the world. The plant, too, has traveled around the world, girdling it in a wide band through the tropics and subtropics. No country has been able to eradicate it.



UMI

# The Pale Purple River Eater

THEY CALL IT the "million dollar weed." The figure is too small. Around the world, millions upon millions of dollars have been spent to fight the water hyacinth.

From Java (right) to the palatial neighborhood of Miami Beach, from Mexico to the pools of New Zealand and the mighty Congo, and most recently on the Nile, this handsome plant clogs rivers, closes waterways, slows or stops boats, even isolates waterfront homes.

In addition, mats of hyacinths take over the habitat of water birds and animals. Roots gradually drain the water of oxygen, killing plants and preventing the oxidation of refuse. The result is a polluted stream.

Spikes of pale purple blossoms seem all innocence and charm. They resemble orchids. The attractive blossoms are one reason why the plant has spread so widely.

Other factors include its ways of reproduction. The blossoms have but a brief burst of glory, perhaps 24 or 48 hours. Then they bend over, spilling pollen onto pistils to fertilize their own seeds. At last the stalk bows into the water where the seeds ripen and fall.

Curiously, the seeds never sprout unless exposed to air. However, the hyacinth has another trick up its leaves. It reproduces like wildfire by growing new shoots from its stem. These break off, become independent plants, and start the process again. A mat of hyacinths can double its size each month during the growing season.

Another trick: the plant has built-in water wings—inflated swellings in the leaf stems. Wind and tide move the buoyant, ever-increasing mass of flowers, glistening green leaves, and dangling roots.

A native of Brazil, it lives there in balance with its environment, causing little trouble.

In other southern lands, however, it has no natural enemies. It multiplies into great rafts, covering ponds and streams with mats so thick a man can walk across them.

It was dubbed "million dollar weed" in Florida, where it has been a pest for decades.

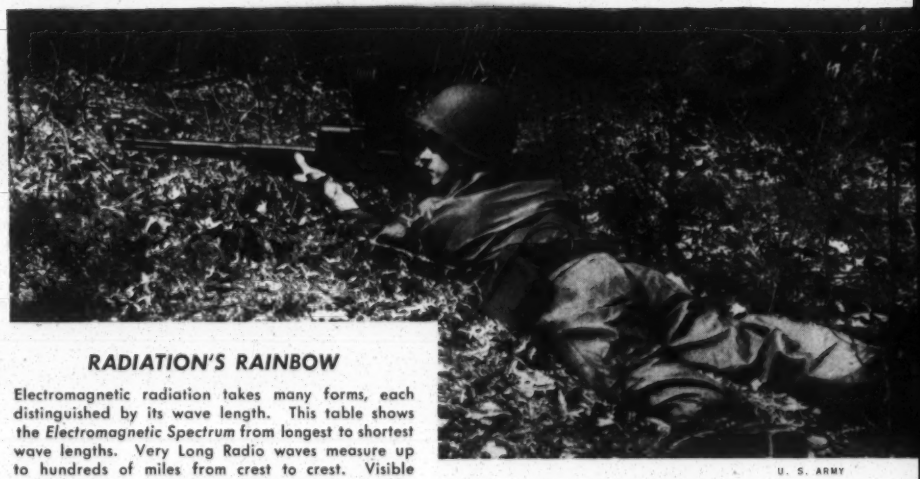
DR. EDWARD BURTON MACDOWELL

The hyacinth's deceptive beauty has caused gardeners to spread it. In northern states it is a favorite for lily ponds, but is killed each winter by frost. Subtropical locations have no such defense.

In the United States, the problem goes back to the New Orleans Cotton Exposition of 1884. A few plants were brought in from Japan for a display.

Admirers took specimens to beautify streams and pools. An explosion followed. The hyacinths spread over the Louisiana bayous, blocking access to oil wells and homes. Machines were invented to rip them up and throw them ashore above the high-tide line. But the machines cannot keep pace with the growth of the plants.

Southern members of Congress, pointing to loss estimates similar to the $35



U. S. ARMY

to its prey by an infrared detector. It seeks the hottest object in the sky around it—in this case the blast of a Communist jet.

Infrared forms the heart of bombsight adapters that permit high-flying aircraft to bomb at night without using giveaway flares. Photo reconnaissance planes capture startlingly clear "photographs" of a city. Infrared sensing devices, immune to jamming (unlike radar), probe the skies for enemy missiles. Beneath the seas it shines in submarine detection.

But peaceful uses predominate. Some 100 of France's cavernous cathedrals are now warmed by infrared. So are Paris sidewalk cafés—even the sidewalks in front of busy stores. In Milan, Italy, solicitous authorities installed an infrared lamp over the head of the traffic cop at one chilly street intersection. A.P.M.

### *RADIATION'S RAINBOW*

**Electromagnetic radiation takes many forms, each distinguished by its wave length. This table shows the *Electromagnetic Spectrum* from longest to shortest wave lengths. Very Long Radio waves measure up to hundreds of miles from crest to crest. Visible Light is but a small segment, centering around the wave length of .000,05 centimeters. Gamma Rays, smallest yet measured, are a hairbreadth .000,000,000,03 centimeters to the wave.**

| Kind of Wave |
|---|
| Very Long Radio |
| Long Radio (ship-to-shore telephone) |
| Standard Broadcast (ordinary radio) |
| 'Short Wave' Radio |
| Microwaves (radar) |
| Far Infrared |
| Infrared |
| Near Infrared |
| Visible Light |
| Ultraviolet |
| Far Ultraviolet |
| X ray |
| Gamma ray |
| Secondary gamma ray coming from cosmic ray particles |

**This spectrum is actually a continuous rainbow; segments are identified only for convenience.**

U. S. NAVY

UMI

U. S. DEPARTMENT OF AGRICULTURE

**Farmers, Soldiers, Housewives Harness**

# *INFRARED RAYS*

IF YOU HAD TOLD this poultry raiser a few years ago that he would soon be using something called infrared radiation to brood his chicks, he would have invited you take a walk around the hen house to clear your head.

Yet today he is one of an increasing number who have found ways to put this invisible light to work. Fruit growers use infrared rays to keep their plants from freezing. A clever infrared device detects a hotbox on a railroad car before the train must grind to a costly stop. With infrared film, astronomers take "heat photographs" of the stars. Biologists observe wary animals at night without being seen. Detectives find it handy; housewives cook with it. Tomorrow, they say, a fogbound motorist will be able to detect an obstacle far up the road.

Such ingenious devices have flowered from a simple, basic physical law: *All solid bodies, when heated, emit radiations.* These rays range from ultraviolet (above visible violet) to infrared (below visible red). With visible light, they form an important segment of the panorama of electromagnetic radiation (see box). For example, when a "red hot" billet of steel rolls out of a mill furnace, what you see is its visible red light. What you don't see is a shower of infrared radiation, a sprinkling of ultraviolet.

Sir William Herschel, who discovered the presence of infrared radiation more than a century and a half ago, made another important discovery. Infrared rays, he found, are not only emitted by all warm objects but are absorbed in different amounts by various substances.

Pioneer discoveries of Herschel and others have been translated into a whole array of potent military weapons. The U. S. Army has modernized its World War II version of the "Sniperscope." Even on a moonless night, the infantryman below can "see" an enemy soldier through an infrared detector mounted atop his rifle. The natural warmth of the enemy soldier's body makes him a clear target against his cooler surroundings.

When Nationalist Chinese fliers shot down an estimated 10 Communist aircraft in a single air battle over Formosa Strait earlier this year, they did it by using the Sidewinder missile. This slim rocket, hanging beneath the wings of a United States Navy plane below, is guided

Still farther north lies Cariboo country, where the gold fever raged. About the time guns saluted destiny at Fort Langley, four prospectors working a nameless brook in this region took up a last hopeful shovelful of sand. A swirl of water in the pan revealed an ounce of nuggets.

Hordes of miners clawed in. They built the roaring town of Barkerville on the flank of the Rocky Mountains. It is a ghost town today, but in 1862 it was the largest western city north of San Francisco.

Fortunes were dug up and squandered, and the boom ended. But travelers on the Cariboo Road still see folk panning a little "color" from the streams and hoping for a nugget.

Greater wealth than the miners dreamed of waited underfoot in other minerals, overhead in the trees, and in the water itself.

Large-scale hydroelectric enterprises already harness some of the rivers and give cheap power. In the aluminum colossus of Kitimat-Kemano (spread over an area as large as Wales) water plunges the height of 16 Niagaras to power a mile-long smelter in which alumina from Jamaica is turned into aluminum ingots for Canadian and United States factories.

Probably British Columbia's greatest growth is in manufacturing. Once she cut timber, mined ore, caught fish—and shipped them away. Now her factories process these raw materials into finished articles to sell all over the world.

Logs that formerly were shipped across the United States border are more often turned into plywood. Raw ores travel no farther than home refineries; natural gas feeds a home-grown petro-chemical industry. Wood pulp is transformed into acetate yarn which finds its way across the world in carpets and gowns. E.S.

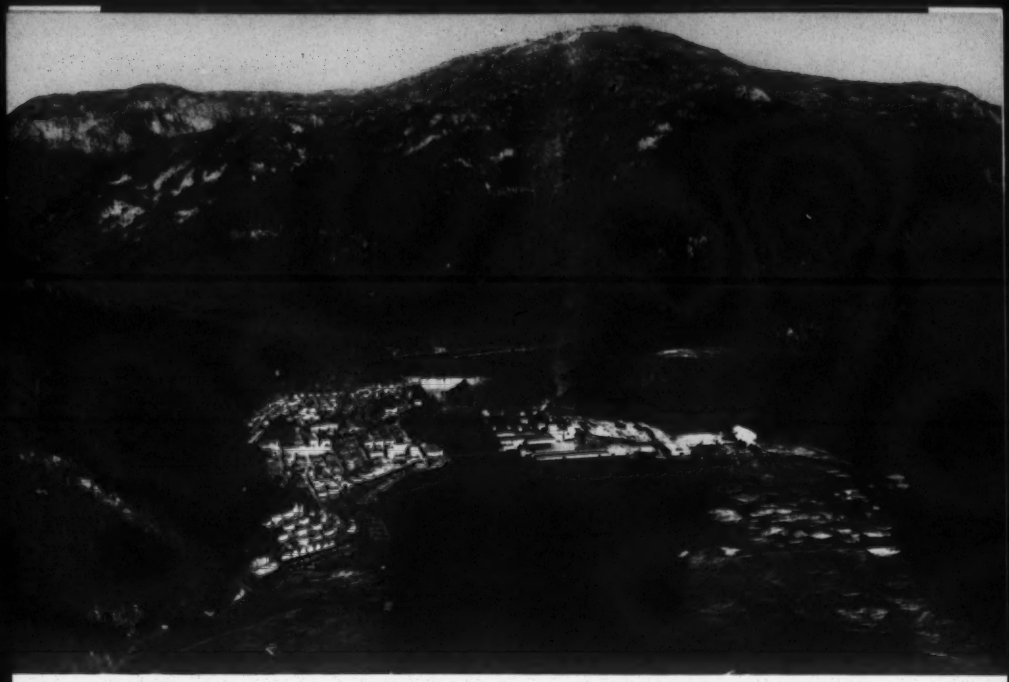
CANADIAN NATIONAL FILM BOARD

University of British Columbia, Vancouver

**SALMON FISHERS** head into Namu, one of the many fishing villages along British Columbia's craggy coast. With net and troll-line the world's largest salmon fleet supplies West Coast canneries. There are few Canadians or Americans who have never tasted salmon from British Columbia, which harvests nearly half of Canada's commercial fish catch.



UMI



VAL HENNELL

# British Columbia, Still Young at 100

MUSKETS CRACKED; cannons boomed. The salute shook snow-flecked pines, then faded across the Fraser River. In a log stockade at Fort Langley a handful of men celebrated Queen Victoria's proclamation bestowing the title "Crown Colony" on a mountain wilderness. So British Columbia was born—100 years ago this month.

The westernmost colony in Canada seemed doomed to a life both short and poor. In 1881 the *London Truth* wrote its obituary: *British Columbia is a barren, cold country that is not worth keeping . . . ever since the [gold] fever died down the place has been going from bad to worse.*

In a few decades "truth" can change. When David S. Boyer of the *National Geographic Magazine's* foreign editorial staff returned from British Columbia this year, he told of a far different land: *I found British Columbia a booming Province, going from good to better.*

B. C., half again as big as Texas, is now the fastest-growing Province of Canada. It has capitalized on its geography.

Are there vast stretches of wooded wilderness? Then carefully cut away the lumber and be wealthy. Is much of the Province jagged mountains? Then harness the streams for electricity. (Both assets come into focus in the modern wood-pulp plant at Ocean Falls pictured above.)

Do the most populous parts of Canada lie on the eastern side of the continent? Then build Vancouver and open a western door to the interior.

The Fraser was the added touch of geography needed to put British Columbia on the economic map in bold letters.

It splits the mountains east of Vancouver, making a path for water transportation—and roads and rails as well.

The first Canadian Pacific train chuffed through the Fraser gap in 1887, linking British Columbia to the interior and, far away, the eastern seaboard. Along the tracks move lead, zinc, silver, and gold from highland mines, and apples, cherries, and peaches from valley farms.

To the north rolls cattle country. Cowboys round up bawling Herefords on ranches that run to thousands of acres.

WILLIAM HEICK; BELOW, RALPH GRAY, NATIONAL GEOGRAPHIC STAFF

## *Gas Pipe Crew Conquers Winter*

SNOW AT PINE PASS, British Columbia, fails to halt a pipeline crew. Slashing through Rocky Mountain wilds and wintry forests, these men laid a 650-mile line of 30-inch steel tube to fill Vancouver's natural gas needs. The tracked machines scour, paint, and wrap pipe sections before they are buried.

From the Peace River gas fields in northern British Columbia and Alberta Provinces, this line carries 300,000,000 cubic feet of gas a day —enough to supply all of B.C., with a large surplus left over to sell to the United States. Eventually, this line is expected to move gas in amounts great enough to produce as much horsepower as the Bonneville and Grand Coulee Dams combined. Before the gas goes to market, refining plants take out gasoline, kerosene, diesel fuel, propane, and sulphur.

FRONTIER TRADITIONS linger in remote parts of British Columbia. Here the Chinese-Canadian Ike Sing, unofficial mayor of Anahim Lake, sells a sweater in his general store. His customer is a Chilcotin Indian squaw. To the west of this settlement, in 1793, Alexander Mackenzie painted his name on the rugged coast with vermilion-stained bear grease—giving British North America a window on the Pacific Ocean.



UMI